REMARKS

Claims 1-14 are all the claims pending in the application. Claims 15-20 are canceled, above. Claims 1-14 stand rejected on prior art grounds. Applicants respectfully traverse these rejections based on the following discussion.

I. The Prior Art Rejections

Claims 1-5 and 7-12 stand rejected under 35 U.S.C. §102(b) as being anticipated by Zimmer (3,987,724). Claims 1-4, 7-11, and 14 stand rejected under 35 U.S.C. §102(b) as being anticipated by Mitter (4,612,874). Claims 6 and 13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Zimmer in view of Mitter. Applicants respectfully traverse these rejections based on the following discussion.

A. The 102(b) Rejection Based on Zimmer

Applicants respectfully traverse this rejection because Zimmer does not teach or suggest a nozzle that includes two rubber layers "wherein said second rubber layer has a durometer that is approximately 1.5 to 4.0 times a durometer of said first rubber layer" as defined by independent claims 1 and 8 or "wherein said second rubber layer comprises a thickness equal to or greater than said first rubber layer, and wherein said durometer of said second rubber layer is dependent upon said thickness of said second layer" as defined by independent claim 8. Instead, Zimmer

merely discloses a foam rubber portion 11 that is coated with Teflon 12.

Zimmer describes that the Teflon sliding strips 12 should be as flexible as possible, and are only used to reduce friction. By making the sliding strips 12 very thin, the sliding strips 12 can be made very flexible, even as flexible as the foam rubber. For example, Zimmer describes item 12 as a "low-friction synthetic material" (column 2, lines 40-41) indicating that the purpose of the sliding strip 12 is to reduce friction, not to decrease the flexibility of the nozzle. It is well known that in order for the Teflon material to remain flexible, the Teflon material must be very thin (see, for example, Mitter column 9, lines 9-16). In other words, Zimmer utilizes the Teflon as a friction reducing agent to allow the applicator to more easily move over the screen 16 and does not utilize the Teflon in order to provide a hardened, durable outer surface as in the claimed invention. Therefore Zimmer cannot teach (or for that matter suggest) "wherein said second rubber layer has a durometer that is approximately 1.5 to 4.0 times a durometer of said first rubber layer" as defined by independent claims 1 and 8 much less "wherein said second rubber layer comprises a thickness equal to or greater than said first rubber layer, and wherein said durometer of said second rubber layer is dependent upon said thickness of said second layer" as defined by independent claim 8.

Applicants note that Zimmer indicates that the Teflon should be as flexible as possible. For example, as described in column 2, lines 56-64, Zimmer describes that a flanking channel 9 can be utilized to increase the vertical compressibility of the Teflon strips. Therefore, while the inventive structure intentionally stiffens the outer rubber layer of the nozzle in order to increase durability, Zimmer teaches away from such a structure by including elements that increase the flexibility of the outer layer. Therefore, one ordinarily skilled in the art would understand that

the Teflon material utilized in Zimmer is substantially flexible because it is formed in such a thin layer. Indeed, the Teflon material shown in Zimmer could be as flexible as the underlying foam rubber 11.

Conventional nozzle design primarily enables the formation of thick, high definition features, and secondarily preserves the stencil mask integrity. For high line definition, a rigid contact surface is preferable. To the contrary, for long mask life, high nozzle contact surface compliance is needed, and this type of mask is described in Zimmer. The compliance achievable with a single-layer compliant nozzle (whether the nozzle be coated with Teflon or not) is limited by the requirement that the nozzle not scoop paste out of the stencil during screening or get abraded by the mask surface. Conventional nozzles, such as the one in Zimmer, focus primarily on line definition, resulting in poor mask wear characteristics. The present invention satisfies both goals, enabling high quality stencil screening with very low stencil wear characteristics by utilizing a nozzle that includes two rubber layers having different durometers. The inventive dual-layer nozzle is superior to the conventional nozzles because it enables much greater overall compliance while still maintaining the high-durometer external surface contact required for high definition stencil printing processes.

Thus, the invention provides a compliant two-layer nozzle contact, where the first layer is softer (has a lower durometer) than the second layer. This allows the second layer to be more durable and stiffer than the first layer and reduce scoop out and for the first layer to provide additional flexibility to the second layer. Therefore, the invention provides a nozzle that has the high durability characteristics of a hard outer surface with the compliance of a soft nozzle. To the contrary, the Zimmer reference only concentrates on flexibility of the nozzle and utilizes a

highly flexible foam rubber nozzle coated with a Teflon surface that is as thin and flexible as possible, where the Teflon surface is only used to decrease the friction of the foam rubber. Because Zimmer teaches that the Teflon surface should be as flexible as possible, Zimmer teaches directly away from the invention and, it is possible that the Teflon surface disclosed in Zimmer could be as flexible as the foam rubber on which it rests.

Therefore, it is Applicants' position that Zimmer does not render obvious the invention defined by independent claims 1 and 8 because Zimmer does not teach (or for that matter suggest) "wherein said second rubber layer has a durometer that is approximately 1.5 to 4.0 times a durometer of said first rubber layer" as defined by independent claims 1 and 8 much less "wherein said second rubber layer comprises a thickness equal to or greater than said first rubber layer, and wherein said durometer of said second rubber layer is dependent upon said thickness of said second layer" as defined by independent claim 8. Thus, independent claims 1 and 8 are not anticipated by Zimmer. Further, dependent claims 2-5, 7, 9-12, and 14 are similarly not anticipated by Zimmer, not only because they depend from a non-anticipated independent claim, but also because of the additional features of the invention they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

B. The 102(b) Rejection Based on Mitter

Applicants respectfully traverse this rejection because Mitter does not teach or suggest a nozzle that includes two rubber layers "wherein said second rubber layer has a durometer that is approximately 1.5 to 4.0 times a durometer of said first rubber layer" as defined by independent

claims 1 and 8 or "wherein said second rubber layer comprises a thickness equal to or greater than said first rubber layer, and wherein said durometer of said second rubber layer is dependent upon said thickness of said second layer" as defined by independent claim 8. Instead, Mitter merely discloses a foam rubber portion 7 that is coated with Teflon 9.

Further, such a structure is not obvious in view of Mitter. More specifically, the Office Action proposes that the foam rubber 7 will be more flexible than the Teflon 9. Applicants respectfully disagree because Mitter describes that the Teflon sliding strips 9 should be as flexible as possible, and are only used to reduce friction. By making the sliding strips 9 very thin, the sliding strips 9 can be made very flexible, even as flexible as the foam rubber. For example, Mitter describes that the Teflon material must be very thin (see, for example, Mitter column 9, lines 9-16). In other words, Mitter utilizes the Teflon as a friction reducing agent to allow the applicator to more easily move over the screen 16 and does not utilize the Teflon in order to provide a hardened, durable outer surface as in the claimed invention. Thus, while the inventive structure intentionally stiffened the outer rubber layer of the nozzle in order to increase durability, Mitter teaches away from such a structure by including elements that increase the flexibility of the outer layer. Therefore, one ordinarily skilled in the art would understand that the Teflon material utilized in Mitter is substantially flexible because it is formed in such a thin layer. Indeed, the Teflon material shown in Mitter could be as flexible as the underlying foam rubber 7.

Conventional nozzle design primarily enables the formation of thick, high definition features, and secondarily preserves the stencil mask integrity. For high line definition, a rigid contact surface is preferable. To the contrary, for long mask life, high nozzle contact surface

compliance is needed, and this type of mask is described in Mitter. The compliance achievable with a single-layer compliant nozzle (whether the nozzle be coated with Teflon or not) is limited by the requirement that the nozzle not scoop paste out of the stencil during screening or get abraded by the mask surface. Conventional nozzles, such as the one in Mitter, focus primarily on line definition, resulting in poor mask wear characteristics. The present invention satisfies both goals, enabling high quality stencil screening with very low stencil wear characteristics by utilizing a nozzle that includes two rubber layers having different durometers. The inventive dual-layer nozzle is superior to the conventional nozzles because it enables much greater overall compliance while still maintaining the high-durometer external surface contact required for high definition stencil printing processes.

Thus, the invention provides a compliant two-layer nozzle contact, where the first layer is softer (has a lower durometer) than the second layer. This allows the second layer to be more durable and stiffer than the first layer and reduce scoop out and for the first layer to provide additional flexibility to the second layer. Therefore, the invention provides a nozzle that has the high durability characteristics of a hard outer surface with the compliance of a soft nozzle. To the contrary, the Mitter reference only concentrates on flexibility of the nozzle and utilizes a highly flexible foam rubber nozzle coated with a Teflon surface that is as thin and flexible as possible, where the Teflon surface is only used to decrease the friction of the foam rubber. Because Mitter teaches that the Teflon surface should be as flexible as possible, Mitter teaches directly away from the invention and, it is possible that the Teflon surface disclosed in Mitter could be as flexible as the foam rubber on which it rests.

Therefore, it is Applicants position that Mitter does not anticipate (and does not render

obvious) the invention defined by independent claims 1 and 8 because Mitter does not teach (or for that matter suggest) "wherein said second rubber layer has a durometer that is approximately 1.5 to 4.0 times a durometer of said first rubber layer" as defined by independent claims 1 and 8 much less "wherein said second rubber layer comprises a thickness equal to or greater than said first rubber layer, and wherein said durometer of said second rubber layer is dependent upon said thickness of said second layer" as defined by independent claim 8. Thus, independent claims 1 and 8 are not anticipated by Mitter. Further, dependent claims 2-5, 7, 9-12 and 14, are similarly not anticipated by Mitter, not only because they depend from a non-anticipated independent claim, but also because of the additional features of the invention they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

C. The 103 Rejection Based on Zimmer and Mitter

Applicants respectfully traverse this rejection because the proposed combination of Zimmer and Mitter does not teach or suggest a nozzle that includes two rubber layers "wherein said second rubber layer has a durometer that is approximately 1.5 to 4.0 times a durometer of said first rubber layer" as defined by independent claims 1 and 8 or "wherein said second rubber layer comprises a thickness equal to or greater than said first rubber layer, and wherein said durometer of said second rubber layer is dependent upon said thickness of said second layer" as defined by independent claim 8. Instead, the proposed combination of Zimmer and Mitter merely discloses a foam rubber portion 7, 11 that is coated with Teflon 9, 12.

Further, such a structure is not obvious in view of the proposed combination of Zimmer

and Mitter. More specifically, the Office Action proposes that the foam rubber will be more flexible than the Teflon. Applicants respectfully disagree because the proposed combination of Zimmer and Mitter describes that the Teflon sliding strips should be as flexible as possible, and are only used to reduce friction. By making the sliding strips very thin, the sliding strips can be made very flexible, even as flexible as the foam rubber. For example, Zimmer describes item 12 as a "low-friction synthetic material" (column 2, lines 40-41) indicating that the purpose of the sliding strip 12 is to reduce friction, not to decrease the flexibility of the nozzle. It is well known that in order for the Teflon material to remain flexible, the Teflon material must be very thin (see, for example, Mitter column 9, lines 9-16). In other words, the proposed combination of Zimmer and Mitter utilizes the Teflon as a friction reducing agent to allow the applicator to more easily move over the screen and does not utilize the Teflon in order to provide a hardened, durable outer surface as in the claimed invention.

Applicants note that the proposed combination of Zimmer and Mitter indicates that the Teflon should be as flexible as possible. For example, as described in column 2, lines 56-64, Zimmer describes that a flanking channel 9 can be utilized to increase the vertical compressibility of the Teflon strips. Therefore, while the inventive structure intentionally stiffens the outer rubber layer of the nozzle in order to increase durability, the proposed combination of Zimmer and Mitter teaches away from such a structure by including elements that increase the flexibility of the outer layer. Therefore, one ordinarily skilled in the art would understand that the Teflon material utilized in the proposed combination of Zimmer and Mitter is substantially flexible because it is formed in such a thin layer. Indeed, the Teflon material shown in the proposed combination of Zimmer and Mitter could be as flexible as the underlying foam rubber.

Conventional nozzle design primarily enables the formation of thick, high definition features, and secondarily preserves the stencil mask integrity. For high line definition, a rigid contact surface is preferable. To the contrary, for long mask life, high nozzle contact surface compliance is needed, and this type of mask is described in Zimmer and Mitter. The compliance achievable with a single-layer compliant nozzle (whether the nozzle be coated with Teflon or not) is limited by the requirement that the nozzle not scoop paste out of the stencil during screening or get abraded by the mask surface. Conventional nozzles, such as the ones in Zimmer and Mitter, focus primarily on line definition, resulting in poor mask wear characteristics. The present invention satisfies both goals, enabling high quality stencil screening with very low stencil wear characteristics by utilizing a nozzle that includes two rubber layers having different durometers. The inventive dual-layer nozzle is superior to the conventional nozzles because it enables much greater overall compliance while still maintaining the high-durometer external surface contact required for high definition stencil printing processes.

Thus, the invention provides a compliant two-layer nozzle contact, where the first layer is softer (has a lower durometer) than the second layer. This allows the second layer to be more durable and stiffer than the first layer and reduce scoop out and for the first layer to provide additional flexibility to the second layer. Therefore, the invention provides a nozzle that has the high durability characteristics of a hard outer surface with the compliance of a soft nozzle. To the contrary, the proposed combination of Zimmer and Mitter reference only concentrates on flexibility of the nozzle and utilizes a highly flexible foam rubber nozzle coated with a Teflon surface that is as thin and flexible as possible, where the Teflon surface is only used to decrease the friction of the foam rubber. Because Zimmer and Mitter teache that the Teflon surface

should be as flexible as possible, the proposed combination of Zimmer and Mitter teaches directly away from the invention and, it is possible that the Teflon surface disclosed in the proposed combination of Zimmer and Mitter could be as flexible as the foam rubber on which it rests.

Therefore, it is Applicants position that the proposed combination of Zimmer and Mitter does not anticipate (and does not render obvious) the invention defined by independent claims 1 and 8 because the proposed combination of Zimmer and Mitter does not teach (or for that matter suggest) "wherein said second rubber layer has a durometer that is approximately 1.5 to 4.0 times a durometer of said first rubber layer" as defined by independent claims 1 and 8 much less "wherein said second rubber layer comprises a thickness equal to or greater than said first rubber layer, and wherein said durometer of said second rubber layer is dependent upon said thickness of said second layer" as defined by independent claim 8. Thus, independent claims 1 and 8 are patentable over the proposed combination of Zimmer and Mitter. Further, dependent claims 6 and 13 are similarly patentable over the proposed combination of Zimmer and Mitter, not only because they depend from a non-anticipated independent claim, but also because of the additional features of the invention they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

II. Formal Matters and Conclusion

In view of the foregoing, Applicants submit that claims 1-14, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition

for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0458.

Respectfully submitted,

Dated: 7-20-05

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:

Long et al.

Serial No.: 10/604,257

Examiner: Laura E. Edwards

Filed: July 7, 2003

Group Art Unit: 1734

Atty. Docket No.: FIS920030100US1

For: DUAL LAYER COMPLIANT POLYMERIC NOZZLE

Commissioner of Patents
PO BOX 1450
Alexandria, VA 22313-1450

SUBMISSION OF REPLACEMENT DRAWING SHEETS

Sir:

Submitted herewith is one replacement drawing sheet comprising Figures 1-2 designating them "Prior Art". Please replace these figures with the accompanying replacement drawings. Approval and acknowledgment of receipt are respectfully requested.

Respectfully Submitted,

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